

XXVIII.—Notes on the Apidæ (*Hymenoptera*) in the Collection of the British Museum, with Descriptions of new Species.
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VI.

AMONG the large collections of Hymenoptera made by Mr. R. E. Turner in Western Australia during his recent visit, probably no single genus is more richly represented than *Megachile*. The earlier species (those collected at Yallingup) were principally found burrowing in the sand, in which they made their cells, or entering holes made by beetles in the tree-trunks; those collected later were irresistibly attracted by the blossoms of gum- and acacia-trees.

Altogether twenty-four species were collected between October 1913 and February 1914, of which six are described as new. In working these out I have had the advantage of consulting Professor Cockerell's MS. keys to the Australian *Megachile*, and have found them extremely useful; by their means I have been able to arrive at the affinities between the new species and described species I have not seen. The discovery of a female *Thaumatoma* is very satisfactory.

A complete list of the species of *Megachile* taken is given. Mr. Turner's itinerary was as follows:—Yallingup, Oct. 1913–Jan. 23, 1914; Busselton (20 miles E. of Yallingup), Jan. 24–27, 1914; Perth (150 miles N.N.E. of Busselton), Feb. 1–7, 1914; Kalamunda (15 miles E. of Perth), Feb. 9–28, 1914.

1. *Megachile (Eumegachile) aurifrons*, Smith.

Perth, Feb. 1914. 2 ♀ ♀.

2. *Megachile (Eumegachile) erythropyga*, Smith.

Yallingup, Kalamunda, Perth. A long series of both sexes.

3. *Megachile (Eumegachile) nasuta*, Smith.

Yallingup. 14 ♀ ♀.

4. *Megachile eriadiformis*, Smith.

Yallingup. A long series of both sexes.

5. *Megachile fabricator*, Smith.

Kalamunda, Perth. 1 ♀, 8 ♂ ♂.

6. *Megachile chrysopyga*, Smith.

Yallingup, Kalamunda, Perth. A long series of both sexes.

7. *Megachile cygnorum*, Ckll.

Perth. 2 ♂ ♂.

8. *Megachile obtusa*, Smith.

Yallingup. 9 ♀ ♀, 7 ♂ ♂.

9. *Megachile hampsoni*, Ckll.

Yallingup. 10 ♀ ♀.

10. *Megachile ferax*, Smith.

Yallingup. 3 ♀ ♀, 10 ♂ ♂.

11. *Megachile trichognatha*, Ckll.

Kalamunda, Perth. A long series of both sexes.

12. *Megachile apicata*, Smith.

Busselton, Yallingup. A series of both sexes.

13. *Megachile clypeata*, Smith.

Busselton, Yallingup. 8 ♀ ♀, 4 ♂ ♂.

14. *Megachile sexmaculata*, Smith.

Yallingup, Perth. 2 ♀ ♀, 1 ♀.

15. *Megachile serricauda*, Ckll.

Perth. 2 ♂ ♂.

16. *Megachile 5-lineata*, Ckll.

Kalamunda. 1 ♀.

17. *Megachile kirbyana*, Ckll.

Yallingup. A long series of both sexes.

18. *Megachile oculipes*, Ckll.

Perth. 9 ♂ ♂.

Key to the new Species.

♀ ♀.

Abdomen mostly black, end of abdomen red, the colour either tegumentary or due to hair.

1. (4) Apex of abdomen with the tegument red.
2. (3) Head, thorax, and abdomen for the most part clothed with fulvous-grey pubescence; tergites 4-6 almost completely dusted with such pubescence; clypeus with the apex emarginate; a broad species, 11 mm. *leeuwinensis*, sp. n.
3. (2) Thoracic and abdominal pubescence griseous; clypeus truncate at apex; a small slender species, 8½ mm. *longiceps*, sp. n.
4. (1) Apex of abdomen with tegument not red.
5. (10) Clypeus very short, deeply emarginate, at least with lateral teeth or laminae.
6. (7) Small (about 8 mm.). Mandibles bidentate; clypeus with a median tooth and a large process on each side *preissi*, Ckll.(1910).
7. (6) Larger (12-15 mm.). No median tooth on clypeus at apex; mandibles 3-4-toothed.
8. (9) Mandibles deeply furrowed along the inner margin, 3-toothed, a large blunt tubercle on the outside at base; axillæ with a distinct patch of whitish pubescence. 15 mm. *axillaris*, sp. n.
9. (8) Mandibles normal, not furrowed along the inner margin, and no tubercle at base, no patches of pale pubescence on axillæ. 12 mm. *speluncarum*, sp. n.
10. (5) Clypeus about half as long as broad, the apex at least not deeply emarginate.
11. (12) Scopa black; abdomen black, tergites 1, 2, and 3 (partly) with white apical fasciæ of pubescence, tergite 6 with a small patch of ferruginous red hair. 16 mm. *resinifera*, sp. n.
12. (11) Scopa pale, sternite 6 sometimes fuscous.
13. (14) Upper part of clypeus with a median raised line, its lower margin 4-dentate, the teeth small *remotula*, Ckll. [(1910).
14. (13) Clypeus truncate at apex, no median raised line.
15. (16) Abdomen subparallel-sided, tergites 5 and 6 with red hair-patches *ferox*, F. Smith.
16. (15) Abdomen ovate; tergite 6 (and sometimes 5 at extreme apex) with red hair. *subferox*, sp. n.

♂ ♂.

1. (4) Anterior tarsi simple or flattened, but not conspicuously dilated; pubescence of head and thorax griseous.

2. (3) Anterior tarsi simple; tergite 6 concave above, rounded and bilobed at apex. 11 mm. *subferox*, sp. n.
3. (2) Anterior tarsi flattened; tergite 6 truncate at apex, serrate. 15 mm. *resinifera*, sp. n.
4. (1) Joint 2 of anterior tarsi conspicuously dilated; pubescence of head and thorax fulvous grey. *leeuwinensis*, sp. n.

19. *Megachile axillaris*, sp. n.

♀. Nigra; facie, thorace, tergitebus 1-3 lateribus, scopaque ventrali (sternite sexto excepto) albo-pilosis; tergitebus 5 et 6 rufo-aurantiacis; alis subhyalinis; clypeo brevissimo, emarginato, lateribus laminatis; mandibulis 3-dentatis, basis externis tuberculatis.

Long. 15 mm.

Black; clypeus, the inner orbits, thorax (especially pleuræ), axillæ and median segment, linear marks on sides of apices of tergites 1-3 with white pubescence; ventral scopa (except sternite 6) silvery white, sternite 6 fuscous; legs more or less sparsely clothed with griseous pubescence, tarsi reddish beneath. Mandibles on the inner and outer sides and tergites 5 and 6 with bright ferruginous-red pubescence.

Mandibles broad at base, narrowing considerably towards apex, tridentate, an opaque area (almost smooth) at base, enclosed between conspicuous shining carinæ approximating towards the apex; inner margin well sculptured, outer margin with a distinct tubercle at base.

Clypeus very short, broad, and deeply emarginate, sides of the emargination produced to form distinct subquadrate laminae.

Head as broad as thorax at widest; abdomen parallel-sided. The whole closely and finely punctured, except enclosed area at base of median segment, the truncation of tergite 1, and the median segment itself, which are subnitidulous and impunctate.

Wings subhyaline.

Length 15 mm.

S.W. AUSTRALIA: Yallingup, 23rd Dec. 1913-23rd Jan. 1914 (*R. E. Turner*). 1♂ ♀♀.

Apparently comes next to *M. preissi*, Ckll. (1910), from Eastern Australia, but much larger; also in *M. preissi* the clypeus has a median tooth and the abdominal hair-fasciæ entire.

20. *Megachile speluncarum*, sp. n.

♀. Nigra, plerumque griseo-pilosa; tergitebus 1-3 fasciis apicalibus albidis, 5 plerumque et 6 omnino rufo-aurantiacis; alis subhyalinis; scopa ventrali alba; clypeo brevissimo, emarginato, lateribus sublaminatis; mandibulis 4-dentatis.

Long. 12 mm.

Black; face and thorax more or less densely clothed with griseous pubescence, densest on inner orbits, pleuræ, and median segment; tergites 1-3 with narrow apical fasciæ of the same pubescence, the sides much denser than median area; scopa silvery white (except sternite 6), sternite 6 fuscous; legs, and especially tarsi of intermediate legs, with griseous pubescence. Tergites 5 (except base and sides) and 6 bright ferruginous red. Mandibles and clypeus with a few ferruginous hairs.

Mandibles broad, of uniform width throughout, quadridentate, evenly punctured, with inconspicuous carinæ; inner margin normal.

Clypeus very short, convex, deeply emarginate, sides of the emargination forming distinct sublaminated processes.

Head as broad as the thorax at widest; abdomen parallel-sided, tergite 3 with a transverse sulcus.

The whole insect uniformly punctured, the punctures even, of medium size; enclosed area at base of median segment, truncation of first tergite, and tegulæ impunctate.

Wings subhyaline.

Length 12 mm.

S.W. AUSTRALIA: Yallingup, 23rd Dec. 1913-23rd Jan. 1914 (*R. E. Turner*). 12 ♀ ♀.

21. *Megachile resinifera*, sp. n.

♀. Nigra, capite thoraceque griseo-pilosis; tergitebus 1 et 2 omnino, 3 lateribus fasciis apicalibus albidis; tergite 6 vix rufo-aurantiaco; scopa ventrali nigra; clypeo latiore quam longiore, apice truncato; mandibulis tridentatis; alis subhyalinis.

Long. 16 mm.

♂. Femina hirsutior, fasciis apicalibus abdominis caret; tarsis anticis vix dilatatis; tergite septimo concavo, producto, apice subserrato.

Black, head and thorax rather profusely clothed with pubescence, that on the vertex and disk of mesonotum fuscous, the front, cheeks, pleuræ, and median segment griseous; tergites 1 and 2 with distinct apical fasciæ and

tergite 3 laterally with white pubescence; tergite 6 with a patch of ferruginous-red hairs. Scopa black. Wings subhyaline.

Mandibles fairly robust, tridentate, with distinct carinæ towards apex.

Clypeus rather broader than long, the apex truncate. There is a sharp tubercle on the metasternum between the hind coxæ. Abdomen parallel-sided, tergites 2 and 3 with broad, shallow, transverse sulci. Whole covered with uniform fine punctures, enclosed area at base of median segment and truncation of first abdominal segment impunctate.

Length 16 mm.

♂. Differs from the ♀ in having only lateral spots (*not* fasciæ) on the apex of segments 1 and 2; the general appearance is more hirsute than the ♀. In secondary sexual characters the following are chiefly noticeable:—antennæ simple; anterior tarsi flattened, not dilated, their colours from ferruginous to ivory-white. Tergite 7 is black; concave, but curled out towards apex; the apex is serrate.

Length 15 mm.

S.W. AUSTRALIA: Yallingup, Nov.–Dec. 1913 (*R. E. Turner*).

A long series of both males and females.

The sexes of this fine species are very different in appearance, but Mr. Turner has no doubt whatever that they are correctly associated. He found the females burrowing in sandy banks and the males flying round the burrows in profusion. Some of the females have large globules of gum in their mandibles, evidently taken up from the *Eucalyptus* known as the "red gum." The gum thus collected is probably used either to keep the sand from falling in on the burrows or to gum together the leaves of which the cells are made. Similar gum was found in the mandibles of specimens of *M. nasuta*, F. Smith.

22. *Megachile leeuwinensis*, sp. n.

♀. Nigra; capite, thorace, tergibus 1–5 fasciis apicalibus griseo-pilosis; sternitibus 5+6 tergiteque 6 rufis, pallide hirsutis; scopa plerumque albida; clypeo brevi, apice emarginato; mandibulis robustis, dentatis; alis hyalinis.

Long. 11 mm.

♂ similis, sed tergibus 5–7 rufis; articulo 2 tarsorum dilatato, tergite 7 concavo-dentato.

Black; head, thorax, and apical fasciæ on tergites 1–5 clothed with fulvous-grey pubescence; tergites 4–6 more or

less completely dusted with fulvous-grey pubescence; tergite 6 and sternites 5 and 6 have the chitin dull red. Legs sparsely clothed with greyish hair, tarsi with ferruginous-red pubescence within.

Wings hyaline.

Mandibles robust, with two distinct apical teeth and two smaller ones towards the base, hardly carinate.

Clypeus short, convex, the apex with a broad shallow emargination, its edge somewhat irregular.

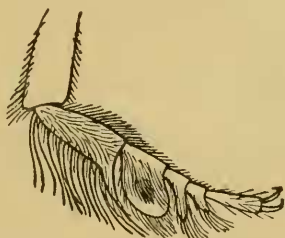
Abdomen short, widest in the middle.

Whole insect for the most part covered with small even puncturing; tergites 4-6 more coarsely punctured, the enclosed area at base of median segment, the truncation of segment, and tegulæ impunctate.

Length 11 mm.

♂. Similar to the ♀ in general appearance, but with the three last tergites dull red.

Fig. 1.



Megachile leeuwinensis, ♂. Anterior tarsi.

Anterior tarsi for the most part ferruginous, the dilatation on joint 2 ivory-white; first tarsal joint with a fringe of silky-white hairs of medium length on the outside; mixed with this fringe are a few (about ten) very long, stout, ferruginous hairs, second tarsal joint with a long spine at apex, the remaining tarsal joints with ferruginous hair. Tergite 7 concave, the apex with two small tubercles rather widely separated.

S.W. AUSTRALIA: Yallingup, 23rd Dec. 1913-23rd Jan. 1914 (*R. E. Turner*): 10 ♀♀, 8 ♂♂.

Rather resembles a large *M. apicata*, Smith. The dilated second tarsal joint is an interesting character in the ♂, and the curious long, stout hairs on the metatarsus are very noticeable.

Megachile ferox, Smith, ♀.

There is a good series of males of this striking species in the collection from Yallingup, and also three specimens which are certainly the female. As the male is the only described sex, a short description of the female is added:—

♀. Nigra, plerumque griseo-pilosa; tergibus 1-3 obscure griseo-fasciatis, 5-6 plus minusve rufo-aurantiacis; alis subhyalinis; scopa ventrali alba; clypeo latiore quam longiore, apice truncato; mandibulis robustis obscure dentatis.

Long. 12 mm.

General facies similar to the male.

Black, head and thorax more or less densely clothed with griseous pubescence, densest on inner orbits and median segment, with distinct white spots on sides of pronotum, mesopleuræ, and axillæ, tergites 1-3 or 4 with narrow apical fasciæ of same colour; scopa silvery white, sternite 6 fuscous; tergites 5 and 6 clothed with bright ferruginous red, a few ferruginous hairs on clypeus and mandibles.

Wings subhyaline.

Mandibles robust, of uniform width; only two distinct teeth, their surface with two conspicuous carinæ in addition to the outer margin.

Clypeus rather broader than long, the apex truncate.

Head about as broad as thorax; abdomen parallel-sided, tergites 3 and 4 with transverse sulci. The whole uniformly punctured, the punctures even, of medium size; enclosed area of median segment, truncation of tergite 1, and tegulæ impunctate.

Wings subhyaline.

Length 12 mm.

This species is closely allied to *M. subferox*, but the differences noted in the key should serve to separate them.

23. *Megachile longiceps*, sp. n.

♀. Nigra, clypeo fronteque pallide aureo-pilosis; area intra-orbitali, genis, thorace ubique, abdominis segmentis 1-4 fasciis apicalibus, pedibusque plerumque albo-pilosis; scopa ventrali alba; tergite sterniteque 6 rufis, griseo-pubescentibus; clypeo apice subtruncato; alis hyalinis.

Long. 8½ mm.

Black; front and clypeus rather sparsely clothed with golden pubescence; inner orbits, cheeks, the whole thorax,

narrow apical fasciæ on tergites 1-4, and the legs clothed with whitish pubescence; scopa silvery white. Tergite and sternite 6 reddish, the pubescence pale golden.

Wings hyaline.

Fig. 2.



Megachile longiceps, ♀. Front view of head.

Head, viewed from the front, very long, about $1\frac{1}{2}$ as long as broad; *mandibles* robust, the cutting-edge without teeth, their surface with one distinct carina; *clypeus* broader than long, shallowly emarginate at apex; abdomen parallel-sided, tergites 2-4 with shallow transverse furrows near their base. The whole covered with small even punctures, except the enclosed space at base of median segment, the truncation of tergite 1, and the tegulæ, which are impunctate.

Length $8\frac{1}{2}$ mm.

S.W. AUSTRALIA: Yallingup, 23rd Dec. 1913-23rd Jan. 1914 (type), 3 ♀ ♀; Busselton, 24th-27th Jan. 1914 (*R. E. Turner*), 4 ♀ ♀.

This little species bears a strong resemblance to *M. apicata*, Smith, from Adelaide and West Australia, and *M. clypeata*, Smith, from West Australia. From the former it may be distinguished by its peculiarly long head (viewed from the front) and from the latter by its normal clypeus, that of *M. clypeata* having two striking tubercles.

24. *Megachile subferox*, sp. n.

♀. Nigra; facie, pleuris, segmento mediano, tergibus 1-4 fasciis apicalibus plus minusve interruptis, pallide pilosis; scopa ventrali alba; tergite 6 rufo-aurantiaco; clypeo subquadrato, apice truncato; mandibulis robustis, apice carinatis; alis subfuscis. Long. 11 mm.

♂ similis, sed hirsutior; tarsi anticis simplicibus, tergite apicali concavo, apice rotunde bilobato; tergibus 4 apice et 5 rufaurantiacis.

Long. 11 mm.

Black, the inner orbits, prothorax, and postscutellum with pale fuscous hair; postorbits, pleuræ, and four spots on mesonotum with whitish pubescence; basal tergite with some long pale hair, tergites 2-4 with apical fasciæ of pale scale-like hairs, rather broken in the middle. Ventral scopa white. Legs sparsely clothed with griseous pubescence; tarsi reddish within. Tergite 6 (and sometimes tergite 5 at apex) densely clothed with ferruginous-red pubescence.

Mandibles massive, the cutting-edge irregularly serrate, the base without distinct sculpture, but with two conspicuous carinæ converging towards the apex.

Clypeus flat, subquadrate, the apex truncate.

The head and thorax are covered with fine even punctures, the thorax with somewhat coarser granular punctures; tergites 2-4 have distinct transverse sulci towards the base.

Wings suffused with fuscous.

Length 11 mm.

♂. Very similar to ♀ in general appearance, but with much longer hair; the pale markings on abdomen are entirely lateral; the reddish-ferruginous pubescence is on tergites 4 (apically) and 5. Anterior tarsi simple, apical segment of abdomen roundly bilobed.

Length 11 mm.

S.W. AUSTRALIA: Yallingup, Nov. 1913-Jan. 1914; Busselton, Jan. 1914 (*R. E. Turner*). A long series of females and five males.

Comes very near to *M. ferox*, Smith; for differences see key to the species.

THAUMATOSOMA, Smith.

Thaumatosoma duboulayi, Smith.

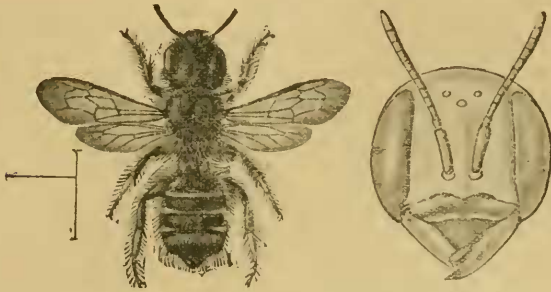
S.W. AUSTRALIA: Yallingup, 14. x. 1913 (1 ♂) and 1. xi. 1913 (1 ♀) (*R. E. Turner*).

This is the first-recorded female in this interesting genus, the four species known at the present time being all described from males.

For a key to the species see *Ann. & Mag. Nat. Hist.* (8) xii. p. 492 (1913); *T. testaceicorne*, Cam. (1908), described from Matheran, N. India, is omitted from this key.

♀. In colour and distribution the pubescence resembles the ♂ and *Megachile* species of the *M. heriadiformis* group. Abdomen distinctly narrowed basally, not parallel-sided, gradually widening towards apex of tergite 3; apical segments rather flattened. Mandibles and clypeus almost as in the subgenus *Eumegachile*; mandibles of equal width along the greater part of their length, rather expanded at apex;

Fig. 3.



Thaumatosoma duboulayi, ♀, and front view of head.

clypeus very short, with a slight emargination at apex, the middle with a longitudinal carina. No malar space. Antennæ 12-jointed. Head very broad, widest at the base of the mandibles. Ventral scopa very pale yellowish. Head, thorax, and tergites 1-4 with even fine punctures, tergites 5 and 6 coarser.

Length 12 mm.

XXIX.—*A new Shrew of the Genus Blarinella from Upper Burma.* By OLDFIELD THOMAS.

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MR. F. KINGDON WARD, who had already sent various small mammals from Western China, has now obtained for the British Museum a few from the mountains in the north of Upper Burma. Besides a *Pachyura* and a *Vandeleuria*, already known from Burmese territory, they include three forms of Chinese affinity, namely *Apodemus speciosus orestes*,